

**Supporting Information for**  
**“Modeling the global bomb-tritium transient signal with the AGCM LMDZ-iso: a method to evaluate aspects of the hydrological cycle”**

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1. Caption for Table S1

**Introduction**

This supporting information provides the references of the multiple data sets used to reconstruct the monthly time-evolution of the oceanic boundary conditions for tritium between 1950 and 2004. Some figures related to the reconstruction of these additional oceanic boundary conditions are also reported. A map indicates the average values of tritium in precipitation during the bomb-peak and the locations of the GNIP stations. Finally, an excel table file reporting the amount of tritium released into the atmosphere by each nuclear-bomb test can be downloaded separately.

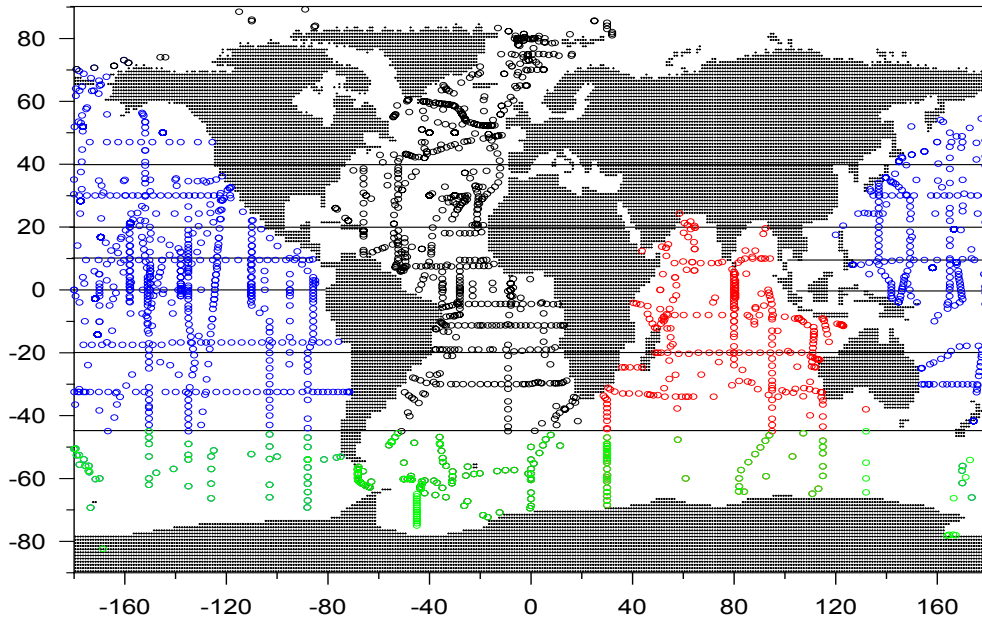
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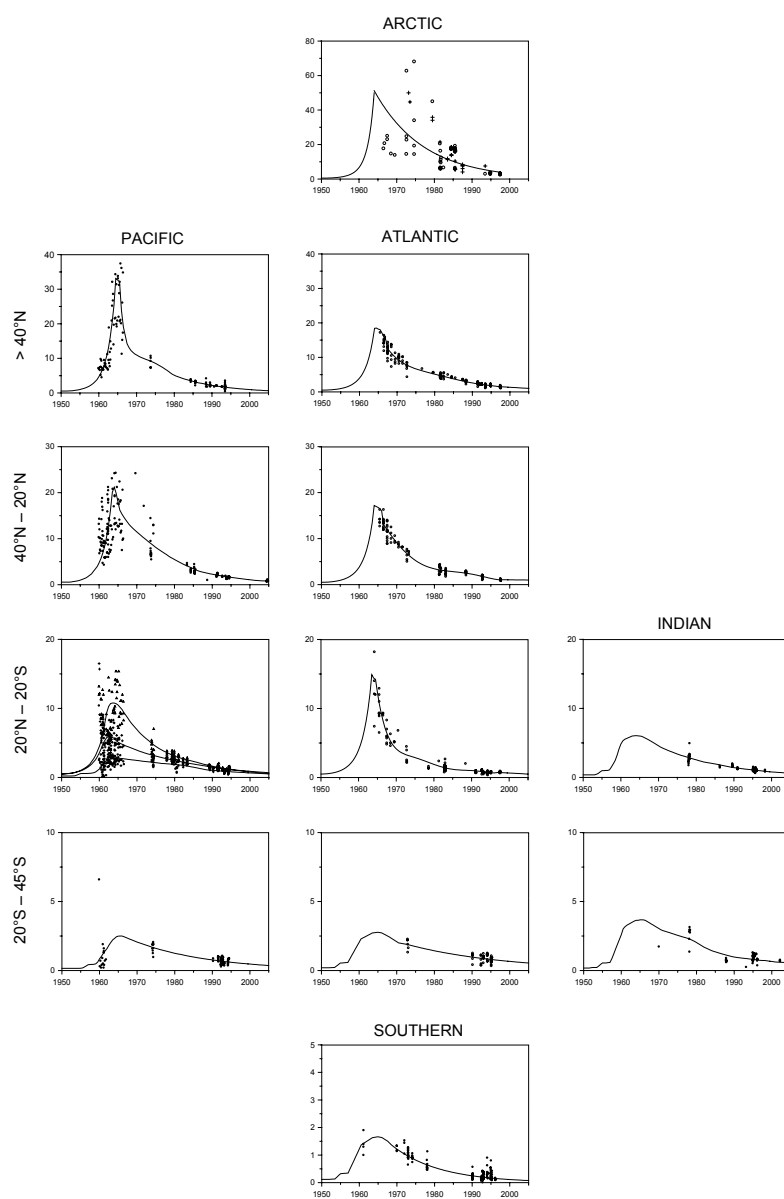
**Figure S1.**

Available data set of tritium in water from the ocean surface. The colors refer to the Atlantic, Pacific, Indian and Southern Oceans.



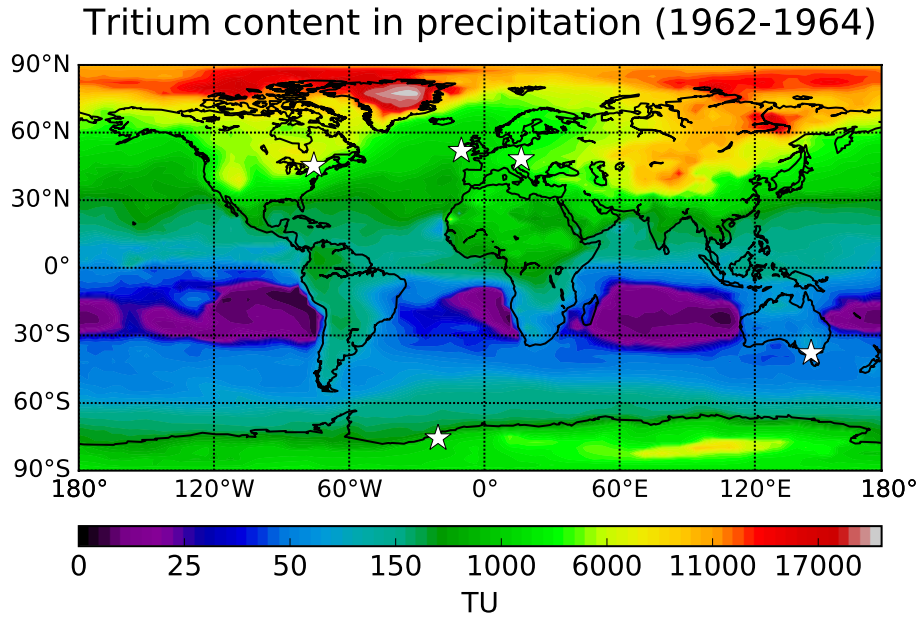
**Figure S2.**

Time-evolution of the tritium concentration (in TU) at the ocean surface from 1950 to 2005. The data were splitted into specific latitudinal bands (after *Broecker et al.* [1986]), where surface tritium concentrations can be considered “homogeneous”. The Arctic data also include the East Greenland Current (open dots). In the Pacific, the  $20^{\circ}\text{N} - 20^{\circ}\text{S}$  band was further subdivided into three latitudinal intervals ( $20^{\circ}\text{N} - 10^{\circ}\text{N}$ ,  $10^{\circ}\text{N} - 0$  and  $0 - 20^{\circ}\text{S}$ ) corresponding to the three curves shown for this latitudinal band.



**Figure S3.**

Spatial variability of average tritium in precipitation from LMDZ-iso for the period 1962-1964. The stars correspond to the GNIP stations used for the model-data comparison.



**Caption for Table S1.**

Date, localization, height of the nuclear cloud and amount of tritium injected into the atmosphere for each individual atmospheric nuclear test between 1945 and 1980. The two nuclear bomb tests with an height of injection too high for the model are highlighted in red.

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